

# LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

## Volume 5 | Technical Appendices

CFA10 | Dunsmore, Wendover and Halton

**Construction assessment (SV-003-010)**

Sound, noise and vibration

November 2013

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Department  
for Transport

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# 1 Introduction

- 1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these is an introduction to the relevant route-wide methodology, assumptions and assessment (Volume 5: Appendix SV-001-000). This relates to the sound, noise and vibration assessment for all community forum areas (CFA).
- 1.1.2 For the Dunsmore, Wendover and Halton community forum area (CFA10), the other three sections are as follows:
- baseline sound, noise and vibration (Volume 5: Appendix SV-002-010);
  - construction sound, noise and vibration (Volume 5: Appendix SV-003-010) (this appendix); and
  - operational sound, noise and vibration (Volume 5: Appendix SV-004-010).
- 1.1.3 The outcomes of the assessment are summarised in Volume 2: CFA Report 10, Dunsmore, Wendover and Halton (CFA Report 10), Section 11.
- 1.1.4 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5, Sound, Noise and Vibration Map Book.
- 1.1.5 This appendix presents the likely noise and vibration impacts, effects and significant effects arising from the construction of the Proposed Scheme for the Dunsmore, Wendover and Halton area on:
- people, primarily where they live ('residential receptors') in terms of:
    - individual dwellings;
    - on a wider community basis, including any shared community open areas; and
  - community facilities such as schools, hospitals, places of worship, and also commercial properties such as offices and hotels, collectively described as 'non-residential receptors' and 'quiet areas'.
- 1.1.6 The assessment of likely impacts, effects and significant effects from construction noise and vibration on agricultural, community, ecological or heritage receptors and the assessment of tranquillity are presented in the following documents within Volume 5:
- |                                   |                     |
|-----------------------------------|---------------------|
| • Agriculture, forestry and soils | Appendix AG-001-010 |
| • Community                       | Appendix CM-001-010 |
| • Ecology                         | Appendix EC-005-010 |
| • Heritage                        | Appendix CH-003-010 |
| • Landscape and Visual            | Appendix LV-001-010 |

## **1.2 Evaluation of impacts and effects**

- 1.2.1 This appendix provides a quantitative assessment of construction noise and vibration impacts/effects and a qualitative assessment of likely significant effects, based on the impacts/effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.
- 1.2.2 Indirect effects arising from temporary changes in traffic patterns on the existing road and rail network as a consequence of constructing the Proposed Scheme are also reported in this appendix, where they will occur within the study area (as defined in Volume 5: Appendix SV-001-000).
- 1.2.3 In undertaking the assessment of sound and vibration, consistent with Environmental Impact Assessment (EIA) Regulations and emerging National Planning Practice Guidance<sup>1</sup> a differentiation between impacts effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV-001-000.
- 1.2.4 The assessment of impacts and effects has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The assessment locations employed in this assessment are presented in Maps SV-03-018 to SV-03-020 (Volume 5, Sound, Noise and Vibration Map Book).

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<sup>1</sup> Information is provided in the Department for Communities and Local Government's emerging National Planning Practice Guidance – Noise <http://planningguidance.planningportal.gov.uk>, (refer to the noise exposure hierarchy), as available on 14th October 2013.

## 2 Scope, assumptions and limitations

### 2.1 Regional and local policy guidance

2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1 and in Volume 5: Appendix SV-001-000. As part of the engagement with local authorities through the Planning Forum Sub Group - Acoustics, information regarding any specific local planning guidance in respect of noise and vibration has been requested. Whilst no information has been received for this study area via the Planning Forum Sub Group - Acoustics, the following local policy guidance on noise and vibration has been identified:

- The Aylesbury Vale District Local Plan - Jan 2004;
- Wycombe Local Plan - Jan 2004; and
- The Local Plan for Chiltern District - Sept 1997.

2.1.2 This guidance has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5: Appendix SV-001-000.

### 2.2 Engagement

2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners via the Planning Forum Sub Group - Acoustics, is set out in Volume 1.

2.2.2 Engagement with communities has been via the Community Forums, as set out in Volume 1. In respect of sound, noise and vibration the following discussions have taken place:

- general discussions in respect of local issues, including possible ways to avoid and mitigate the potential impacts of noise or vibration;
- September / October 2012: a specific presentation about sound, noise and vibration with discussion afterwards with one of the project team specialists;
- November / December 2012: specific request for the Community Forum regarding baseline sound monitoring locations;
- January / February 2013: feedback to the Community Forum on any proposed baseline monitoring locations; and
- verbal / written responses to questions and sound, noise and vibration.

### 2.3 Methodology

2.3.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1). Further clarification regarding specific areas is presented in the SMR addendum (Volume 5:

Appendix CT-001-000/2). Further information is contained in Volume 5: Appendix SV-001-000.

## **2.4 Assumptions**

- 2.4.1 Route-wide assumptions are outlined in Volume 1 and are further detailed in Volume 5: Appendix SV-001-000. Local assumptions that apply to the assessment of construction sound noise and vibration within this area are set out in Volume 2: CFA Report 10.

## **2.5 Limitations**

- 2.5.1 The route-wide limitations and the approach adopted to assure that they will not impact the robust assessment of sound, noise and vibration are presented in Volume 5: Appendix SV-001-000. No specific additional limitations are identified for this study area.



## **3 Environmental baseline**

### **3.1 Existing baseline**

- 3.1.1 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors. The existing and future baseline airborne sound levels derived from these measurements are given in Volume 5: Appendix SV-002-010. Details of the baseline data collection and the methodology are given in Volume 5: Appendix SV-001-000 and specifically for this study area in Volume 5: Appendix SV-002-010.

### **3.2 Future baseline**

- 3.2.1 The assessment of noise from construction activities assumes a baseline year of 2017 which represents the period immediately prior to the start of the construction period. As a reasonable worst case, it has been assumed that no change in baseline sound levels will occur between the existing baseline (2012/13) and the future baseline year of 2017. The assessment of noise from construction traffic assumes a baseline year of 2021, representative of the middle of the construction period when the construction traffic flows are expected to be at their peak. Further information can be found in the Traffic and Transport assessment (Volume 5: Appendix TR-001-010).

## **4 Effects arising during construction**

### **4.1 Introduction**

4.1.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts and effects are presented. This is followed by the identification of significant effects and the evidence used to support these conclusions.

4.1.2 The structure of this assessment report is as follows:

- Avoidance and mitigation measures
- Quantitative identification of impact and effects
  - Ground-borne sound and vibration
    - residential
    - non-residential
  - Airborne sound
    - residential
    - non-residential
- Assessment of impacts and effects
  - residential receptors: direct effects – dwellings
  - residential receptors: direct effects – communities
  - residential receptors: indirect effects
  - non-residential receptors: direct effects
  - non-residential receptors: indirect effects
  - cumulative effects from the Proposed Scheme and other committed development

### **4.2 Avoidance and mitigation measures**

4.2.1 These measures are set out in Volume 2: CFA Report 10.

### **4.3 Quantitative identification of impacts and effects**

#### **Ground-borne vibration**

4.3.1 Assessment locations defined for the quantitative assessment of impacts are shown on Maps SV-03-018 to SV-03-020 (Volume 5, Sound, Noise and Vibration Map Book).

- 4.3.2 For each assessment location, the assessment results for residential receptors are presented in Table 1. No vibration effects have been predicted on non-residential receptors. Explanation of the information in Table 1 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:


	Where the significant effect column is highlighted, then a significant effect is identified at the referenced community, or individual receptor.
*	Significant effect – the quantitative impact methodology has identified either: <ol style="list-style-type: none"> <li>1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or</li> <li>2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not give rise to a significant effect.</li> </ol>
~	The forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000).
A	Type of effect – adverse effect
S	Type of effect – significant adverse effect
NA	Type of effect – not generally an adverse effect
B	Type of effect – for non-residential receptors further detail about the type of effect is set out in the text of Appendix SV-001-000
R	Type of receptor - residential
V1	Type of receptor: <ul style="list-style-type: none"> <li>(V1) vibration sensitive research and manufacturing, hospital, and university equipment;</li> <li>(V2) hotels, hospital wards and education dormitories;</li> <li>(V3) offices, schools and places of worship; or</li> <li>(V4) workshops.</li> </ul>
T	Receptor design – typical
S	Receptor design – special

**Table 1: Assessment of construction induced ground-borne vibration at residential receptors**

Assessment location		Impact criteria			Significance criteria										Significant effect
ID	Area represented	Peak particle velocity (PPV) [mm/s] on foundation	Typical/highest monthly indoor vibration dose value (VDV) [m/s <sup>-1.75</sup> ]		Construction activity resulting in highest forecast vibration levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [m]	Mitigation effect	
368781	Rocky Lane, Wendover	0.14	0.08/0.08	-	Small Dean viaduct southern approach embankment - filling - medium roller.	NA	1	R	T		-	-	1	-	~
368834	Rocky Lane, Wendover	0.54	0.23/0.23	-	Small Dean viaduct southern approach embankment - filling - medium roller.	A	1	R	T		-	-	1	-	~
372817	Rocky Lane, Wendover	0.13	0.07/0.07	-	Small Dean viaduct southern approach embankment - filling - medium roller.	NA	1	R	T		-	-	1	-	~
700358	Dobbins Lane, Wendover	0.19	0.1/0.1	-	South Heath Cutting - Railtrack Formation / Sub-Ballast - Medium Roller	NA	1	R	T		-	-	2	-	~
314704	Nash Lee Road, Terrick	0.12	0.06/0.06	-	Wendover north cutting – rail track formation / sub-ballast - medium roller.	NA	4	R	T		-	-	3	-	~
359264	London Road, Wendover	0.26	0.13/0.13	-	Small Dean viaduct northern approach embankment - filling - medium roller.	NA	2	R	T		-	-	2	-	~
359406	Bacombe Lane, Wendover	0.25	0.12/0.12	-	Small Dean viaduct northern approach embankment - filling - medium roller.	NA	3	R	T		-	-	2	-	~

## Airborne sound: direct impacts and effects

- 4.3.3 Activities associated with the construction phases of the Proposed Scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:
- residential receptors, both as individual dwellings and communities; and
  - non-residential receptors, including quiet areas.
- 4.3.4 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly  $L_{pAeq,T}$  noise levels from construction activities have been calculated at the façade of all assessment locations, which are representative of a number of receptors in the study area.
- 4.3.5 Volume 2: CFA Report 10 makes reference to any major construction activity during the evening and at night but the assessment has also considered the minor essential activities that will have to operate on a 24/7 basis for reasons of safety and engineering practicability (e.g. water pumps).
- 4.3.6 The assessment results, impact criteria and significance criteria for the assessment of the scheme at residential and non-residential receptors are presented in Table 2 and Table 3 respectively.
- 4.3.7 The construction activity resulting in highest forecast noise levels is reported in Table 2 and Table 3 for each assessment location and time period, where the highest forecast noise level from any individual construction activity is above 40dB  $L_{pAeq,T}$  during the daytime and evening periods and 35dB  $L_{pAeq,T}$  during the night-time. Where the highest forecast noise level from any individual construction activity is less than 40dB  $L_{pAeq,T}$  during the daytime and evening or 35dB  $L_{pAeq,T}$  during the night-time no activities have been reported.
- 4.3.8 Explanation of the information within Table 2 and Table 3 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

 Where the significant effect column is highlighted, then a significant effect is identified at the referenced community, or individual non-residential receptor

- \* Significant effect – the quantitative impact methodology has identified either:
  - 1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or
  - 2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not give rise to a significant effect.
- ~ The forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000).
- A Type of effect – adverse effect
- S Type of effect – significant adverse effect

NA	Type of effect – not generally an adverse effect
B	Type of effect – for non-residential receptors further detail about the type of effect is set out in the text of Appendix SV-001-000
R	Type of receptor - residential
G	Type of receptor:  (G1) theatres, large auditoria and concert halls;  (G2) sound recording and broadcast studios;  (G3) places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls;  (G4) schools, colleges, hospitals, hotels and libraries; or  (G5) offices and general commercial premises.
T	Receptor design – typical
S	Receptor design - special
H	Existing environment – high existing ambient noise levels: daytime level more than 75dB, evening-time level more than 65dB or night-time level more than 55dB $L_{pAeq}$ at the façade.
NI	Mitigation effect - identified as likely to qualify for noise insulation under the draft Construction Code of Practice (draft CoCP).
D,E,N	Impact duration (months) – duration of impact during the day (D), evening (E) or night (N).

Table 2: Assessment of construction noise at residential receptors

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
312373	North Lee Lane, Terrick	45/51 [A]	-	-	Day: haul route movements - to and from road.	NA	1	R	T	-	-	-	-	-		
312509	Nash Lee Road, Terrick	41/49 [A]	-	-	Day: haul route movements - on site.	NA	5	R	T	-	-	-	-	-		
313082	North Lee Lane, Terrick	45/51 [A]	-	-	Day: Haul route movements - to and from road.	NA	5	R	T	-	-	-	-	-		
313100	North Lee Lane, Terrick	45/51 [A]	-	-	Day: Haul route movements - to and from road.	NA	1	R	T	-	-	-	-	-		
313140	North Lee Lane, Terrick	43/46 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-		
313291	North Lee Lane, Terrick	42/47 [A]	-	-	Day: haul route movements - on site.	NA	4	R	T	-	-	-	-	-		
313337	Risborough Road, Stoke Mandeville	40/47 [A]	-	-	Day: haul route movements - on site.	NA	8	R	T	-	-	-	-	-		
314444	Nash Lee Road, Terrick	41/49 [A]	-	-	Day: haul route movements - on site.	NA	13	R	T	-	-	-	-	-		
314625	Unnamed Road, Ellesborough	44/52 [A]	-	-	Day: haul route movements - on site.	NA	6	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
314652	Nash Lee Road, Terrick	48/57 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-		
314668	Nash Lee Road, Terrick	48/55 [A]	-	-	Day: Wendover north cutting - cutting excavation.	NA	1	R	T	-	-	-	-	-		
314704	Nash Lee Road, Terrick	53/64 [A]	-	-	Day: Wendover north cutting - cutting excavation.	NA	4	R	T	-	-	-	-	-		
314865	Wendover Road, Stoke Mandeville	45/53 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-		
350579	London Road, Wendover	42/50 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	H	-	-	-	-		
350695	Cobblers Hill, Wendover	42/50 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-		
350753	London Road, Wendover	44/50 [C]	-	-	Day: haul route movements - on site.	NA	3	R	T	H	-	-	-	-		
350796	London Road, Wendover	42/50 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-		
350868	London Road, Wendover	45/52 [>C]	-	-	Day: haul route movements - on site.	NA	1	R	T	H	-	-	-	-		



Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
350945	Wendover Dean, Aylesbury	44/52 [B]	-	-	Day: haul route movements - on site.	NA	1	R	T	H	-	-	-	-		
351596	Aylesbury Road, Great Missenden	42/48 [B]	<40/<40 [>C]	<35/<35 [>C]	Day: haul route movements - on site.	NA	9	R	T	H	-	-	-	-		
351644	Aylesbury Road, Great Missenden	43/49 [C]	<40/<40 [>C]	<35/<35 [>C]	Day: Dutchlands Farm to Rushmoor Wood footbridge - construction works - substructure.	NA	2	R	T	H	-	-	-	-		
351671	London Road, Wendover	43/51 [C]	-	-	Day: haul route movements - on site.	NA	1	R	T	H	-	-	-	-		
351696	Bowood Lane, Wendover	48/55 [A]	-	-	Day: Wendover Dean viaduct - construction works – substructure.	NA	4	R	T	-	-	-	-	-		
351710	Wendover Dean, Aylesbury	50/58 [A]	-	-	Day: Wendover Dean viaduct - construction works – substructure.	NA	1	R	T	-	-	-	-	-		
351740	Wendover Dean, Aylesbury	47/56 [A]	-	-	Day: Wendover Dean viaduct - construction works – substructure.	NA	1	R	T	-	-	-	-	-		
351792	Bowood Lane, Wendover	50/57 [A]	-	-	Day: Wendover Dean viaduct - construction works - substructure.	NA	3	R	T	-	-	-	-	-		
351934	Kings Lane, Wendover	<40/47 [A]	<40/<40 [B]	<35/<35 [C]	Day: Dutchlands Farm to Rushmoor Wood footbridge - construction works - substructure.	NA	1	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
355409	Hunts Green, The Lee	40/48 [A]	<40/<40 [B]	<35/<35 [>C]	Day: South Heath cutting - cutting excavation.	NA	1	R	T	H	-	-	-	-		
355417	Hunts Green, The Lee	41/48 [A]	<40/<40 [B]	<35/<35 [>C]	Day: South Heath cutting - cutting excavation.	NA	1	R	T	H	-	-	-	-		
355448	Hunts Green, The Lee	<40/45 [A]	<40/<40 [A]	<35/<35 [A]	Day: South Heath cutting - cutting excavation.	NA	6	R	T	-	-	-	-	-		
355498	The Lee, Great Missenden	<40/<40 [A]	<40/<40 [A]	<35/<35 [A]		NA	5	R	T	-	-	-	-	-		
355734	Nash Lee Lane, Wendover	47/57 [A]	-	-	Day: Wendover north cutting - cutting excavation.	NA	7	R	T	-	-	-	-	-		
356230	Aylesbury Road, Wendover	51/56 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works – substructure.	NA	82	R	T	-	-	-	-	-		
356878	Small Dean Lane, Wendover	44/50 [A]	-	-	Day: haul route movements - on site.	NA	3	R	T	-	-	-	-	-		
356932	London Road, Wendover	48/55 [>C]	-	-	Day: haul route movements - on site.	NA	1	R	T	H	-	-	-	-		
357093	Bacombe Lane, Wendover	45/50 [A]	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	NA	2	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
357199	Nash Lee Lane, Wendover	57/65 [A]	-	-	Day: Wendover north cutting - cutting – excavation.	NA	7	R	T	-	-	-	-	-		
357521	Ellesborough Road, Wendover	<40/42 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - reinstatement - finishes/embankment - filling (Including removal of props).	NA	5	R	T	-	-	-	-	-		
357547	Ellesborough Road, Wendover	45/51 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - superstructure - construct walls.	NA	5	R	T	-	-	-	-	-		
357601	Ellesborough Road, Wendover	53/59 [B]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting – excavation.	NA	5	R	T	H	-	-	-	-		
357663	Ellesborough Road, Wendover	49/53 [A]	-	-	Day: Wendover north cutting - cutting excavation.	NA	1	R	T	-	-	-	-	-		
357730	Ellesborough Road, Wendover	54/57 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - superstructure - construct walls.	NA	4	R	T	-	-	-	-	-		
357877	Nash Lee End, Wendover	49/52 [A]	-	-	Day: Wendover north cutting - rail track formation / sub-ballast.	NA	1	R	T	-	-	-	-	-		
357971	Nash Lee Lane, Wendover	52/59 [A]	-	-	Day: Wendover north cutting - cutting excavation.	NA	6	R	T	H	-	-	-	-		

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
358410	Wendover Road, Stoke Mandeville	42/50 [A]	-	-	Day: Wendover north cutting - cutting excavation.	NA	2	R	T	-	-	-	-	-	
358677	Wendover Road, Stoke Mandeville	41/50 [A]	-	-	Day: Wendover north cutting - cutting excavation.	NA	3	R	T	-	-	-	-	-	
358870	Little London, Wendover	<40/44 [A]	-	-	Day: haul route movements - on site.	NA	3	R	T	-	-	-	-	-	
359140	Small Dean Lane, Wendover	47/53 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	2	R	T	-	-	-	-	-	
359159	Small Dean Lane, Wendover	47/52 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-	
359175	Bacombe Lane, Wendover	49/54 [A]	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	NA	1	R	T	-	-	-	-	-	
359188	Bacombe Lane, Wendover	<40/44 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - reinstatement - finishes/embankment - filling (Including removal of props).	NA	2	R	T	-	-	-	-	-	
359264	London Road, Wendover	56/62 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
359284	London Road, Wendover	50/59 [A]	-	-	Day: Grove Farm Access Track Footbridge - construction works - substructure.	NA	1	R	T	-	-	-	-	-		
359341	Bacombe Lane, Wendover	47/53 [A]	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	NA	9	R	T	-	-	-	-	-		
359368	Bacombe Lane, Wendover	50/57 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - site set up.	NA	1	R	T	-	-	-	-	-		
359406	Bacombe Lane, Wendover	68/76 [A]	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	S	3	R	T	-	-	-	D 16	NI	CSV1 o - Co1*	
359465	Ellesborough Road, Wendover	57/61 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	4	R	T	-	-	-	-	-		
359523	Ellesborough Road, Wendover	59/66 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	A	3	R	T	-	-	-	D 7	-	CSV1 o-Co2	
359540	Ellesborough Road, Wendover	59/66 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	A	6	R	T	-	-	-	D 6	-	CSV1 o-Co2	
359570	Ellesborough Road,	72/81 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	S	1	R	T	H	-	-	D 15	NI	CSV1 o-Co2	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
	Wendover														
359628	Ellesborough Road, Wendover	80/85 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	S	8	R	T	H	-	-	D 14	NI	CSV1 o-Co2
359821	Forest Close, Wendover	62/68 [B]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	40	R	T	H	-	-	-	-	
359991	Coombe Avenue, Wendover	62/67 [B]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	20	R	T	H	-	-	-	-	
360117	Thornton Crescent, Wendover	55/59 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	31	R	T	-	-	-	-	-	
360282	Witchell, Wendover	54/61 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	32	R	T	H	-	-	-	-	
360527	High Street, Wendover	51/58 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	34	R	T	H	-	-	-	-	
361026	Dobbins Lane, Wendover	55/61 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	67	R	T	-	-	-	-	-	
361089	Vinetrees,	54/59	-	-	Day: Wendover Green Tunnel: phase 2a section	NA	59	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
	Wendover	[A]			B - construction works - substructure.											
361283	Tring Road, Wendover	54/59 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	30	R	T	-	-	-	-	-		
361353	Little Hampden Close, Wendover	58/66 [B]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	62	R	T	H	-	-	-	-		
361567	South Street, Wendover	56/62 [A]	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	NA	4	R	T	H	-	-	-	-		
361934	Dobbins Lane, Wendover	56/61 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	14	R	T	-	-	-	-	-		
362092	Dobbins Lane, Wendover	56/60 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	28	R	T	-	-	-	-	-		
362169	Chiltern Road, Wendover	53/58 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	60	R	T	-	-	-	-	-		
362513	Dobbins Lane, Wendover	55/59 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	22	R	T	-	-	-	-	-		
362638	Thornton Crescent,	54/60 [B]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works -	NA	49	R	T	H	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
	Wendover				substructure - cutting - excavation.											
362785	Bridleways, Wendover	50/57 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - superstructure - construct walls.	NA	22	R	T	-	-	-	-	-		
362860	Dobbins Lane, Wendover	54/58 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	83	R	T	-	-	-	-	-		
363376	Nightingale Road, Wendover	52/57 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	103	R	T	-	-	-	-	-		
363661	Dobbins Lane, Wendover	55/58 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	19	R	T	-	-	-	-	-		
364087	Orchard Close, Wendover	52/56 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	37	R	T	-	-	-	-	-		
364294	The Cedars, Wendover	53/57 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	53	R	T	-	-	-	-	-		
364751	Haglis Drive, Wendover	51/55 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	64	R	T	-	-	-	-	-		
365001	Lionel Avenue, Wendover	52/55 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	24	R	T	-	-	-	-	-		



Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
365130	Aylesbury Road, Wendover	50/53 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	15	R	T	-	-	-	-	-		
365216	Aylesbury Road, Wendover	49/53 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	10	R	T	-	-	-	-	-		
365280	Aylesbury Road, Wendover	51/55 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	1	R	T	-	-	-	-	-		
365348	Aylesbury Road, Wendover	48/52 [C]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	37	R	T	H	-	-	-	-		
365756	Bryants Acre, Wendover	50/55 [C]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	48	R	T	H	-	-	-	-		
366563	Lionel Avenue, Wendover	50/54 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	38	R	T	-	-	-	-	-		
366705	Lionel Avenue, Wendover	47/54 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - superstructure - construct walls.	NA	32	R	T	-	-	-	-	-		
366745	Aylesbury Road, Wendover	53/58 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works -	NA	19	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
					substructure - cutting - excavation.											
366911	Liffre Drive, Wendover	50/54 [B]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	NA	43	R	T	H	-	-	-	-		
367404	Aylesbury Road, Wendover	47/51 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	NA	2	R	T	-	-	-	-	-		
368607	London Road, Wendover	46/54 [>C]	-	-	Day: haul route movements - on site.	NA	7	R	T	H	-	-	-	-		
368658	London Road, Wendover	44/51 [>C]	-	-	Day: haul route movements - on site.	NA	7	R	T	H	-	-	-	-		
368776	Rocky Lane, Wendover	49/56 [A]	-	-	Day: haul route movements - on site.	NA	6	R	T	-	-	-	-	-		
368781	Rocky Lane, Wendover	56/60 [A]	-	-	Day: Rocky Lane culvert - drainage / culvert works.	NA	1	R	T	-	-	-	-	-		
368819	London Road, Wendover	46/53 [>C]	-	-	Day: haul route movements - on site.	NA	4	R	T	H	-	-	-	-		
368834	Rocky Lane, Wendover	56/65 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-		
368919	London Road,	47/52	-	-	Day: haul route movements - on site.	NA	3	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
	Wendover	[A]														
369011	Hale Lane, Wendover	48/53 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	4	R	T	-	-	-	-	-		
369123	Hale Lane, Wendover	46/51 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	5	R	T	-	-	-	-	-		
369288	Hale Road, Wendover	51/56 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	11	R	T	-	-	-	-	-		
369370	Hale Road, Wendover	53/58 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	12	R	T	-	-	-	-	-		
369461	Heron Path, Wendover	54/60 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	7	R	T	H	-	-	-	-		
369725	Honey Banks, Wendover	53/58 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	38	R	T	H	-	-	-	-		
369820	Hale Road, Wendover	54/59 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	1	R	T	H	-	-	-	-		
369935	Hale Road, Wendover	54/59 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	7	R	T	-	-	-	-	-		
370028	Hazeldene, Wendover	54/60 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	8	R	T	H	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
370197	Church Lane, Wendover	52/58 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	4	R	T	H	-	-	-	-		
370218	Hale Road, Wendover	48/54 [A]	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	NA	3	R	T	-	-	-	-	-		
370600	Hampden Road, Wendover	52/56 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	65	R	T	H	-	-	-	-		
371603	The Poplars, Wendover	53/58 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	136	R	T	-	-	-	-	-		
371673	Jusons Glebe, Wendover	53/57 [A]	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	NA	31	R	T	-	-	-	-	-		
372731	Rocky Lane, Wendover	43/51 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-		
372742	Rocky Lane, Wendover	47/55 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-		
372781	Rocky Lane, Wendover	46/55 [A]	-	-	Day: haul route movements - on site.	NA	2	R	T	-	-	-	-	-		
372817	Rocky Lane, Wendover	49/60 [A]	-	-	Day: Rocky Lane south cutting - cutting excavation.	NA	1	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
372897	Kings Ash, Great Missenden	<40/<40 [A]	-	-		NA	2	R	T	-	-	-	-	-		
372916	Kings Ash, Great Missenden	<40/<40 [A]	-	-		NA	2	R	T	-	-	-	-	-		
372950	Chesham Lane, The Lee	<40/<40 [A]	-	-		NA	2	R	T	-	-	-	-	-		
372983	Kings Ash, Great Missenden	<40/<40 [A]	-	-		NA	5	R	T	-	-	-	-	-		
373067	Kings Ash, Great Missenden	<40/<40 [A]	-	-		NA	1	R	T	-	-	-	-	-		
373102	Kings Ash, Great Missenden	<40/<40 [A]	-	-		NA	1	R	T	-	-	-	-	-		
373141	London Road, Wendover	<40/<40 [A]	-	-		NA	1	R	T	-	-	-	-	-		
700305	Rocky Lane, Wendover	46/55 [A]	-	-	Day: haul route movements - on site.	NA	1	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
700312	Hale Road, Wendover	49/55 [A]	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	NA	1	R	T	-	-	-	-	-		
700313	Heron Path, Wendover	52/59 [A]	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	NA	1	R	T	H	-	-	-	-		
700315	South Street, Wendover	56/61 [B]	-	-	Day: Wendover Green Tunnel: phase 2a section B - reinstatement - finishes/embankment - filling (Including removal of props).	NA	2	R	T	H	-	-	-	-		
700317	Ellesborough Road, Wendover	69/76 [A]	-	-	Day: phase 2 Ellesborough Road - set-up temporary road diversion (North of Existing).	S	1	R	T	H	-	-	D 13	NI	CSV1 o-C02	
700320	Bacombe Lane, Wendover	53/59 [A]	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	NA	1	R	T	-	-	-	-	-		
700321	Ellesborough Road, Wendover	61/66 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting excavation.	A	1	R	T	-	-	-	D 6	-	CSV1 o-C02	
700323	Ellesborough Road, Wendover	59/68 [A]	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	A	1	R	T	-	-	-	D 8	-	CSV1 o-C02	

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
700324	Ellesborough Road, Wendover	62/67 [A]	-	-	Day: phase 2 Ellesborough Road - set-up temporary road diversion (north of existing).	A	1	R	T	-	-	-	D 6	-	CSV1 o-C02	
700326	Forest Close, Wendover	62/68 [B]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting excavation.	NA	2	R	T	H	-	-	-	-		
700327	Bridleways, Wendover	54/59 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - superstructure - construct walls.	NA	1	R	T	-	-	-	-	-		
700328	Ellesborough Road, Wendover	59/62 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting excavation.	NA	2	R	T	-	-	-	-	-		
700358	Aylesbury Road, Great Missenden	56/67 [A]	<40/<40 [B]	<35/<35 [C]	Day: Cottage Farm footpath and private access footbridge - finishes.	A	1	R	T	-	-	-	D 2	-	~	
700473	Ellesborough Road, Wendover	53/59 [A]	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting excavation.	NA	1	R	T	-	-	-	-	-		

Table 3: Assessment of construction noise at non-residential receptors

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
313337	Risborough Road, Stoke Mandeville	40/47	-	-	Day: haul route movements - on site.	B	1	G5	T	-	-	-	-	-		
314444	Nash Lee Road, Terrick	41/49	-	-	Day: haul route movements - on site.	B	1	G4	T	-	-	-	-	-		
350753	London Road, Wendover	44/50	-	-	Day: haul route movements - on site.	B	1	G5	T	H	-	-	-	-		
356230	Aylesbury Road, Wendover	51/56	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	B	1	G3	T	-	-	-	D 1	-	*	
357950	Nash Lee End, Wendover	48/55	-	-	Day: Wendover north cutting - cutting - excavation.	B	1	G5	T	H	-	-	-	-		
358776	Nash Lee End, Wendover	46/51	-	-	Day: B4009 Nash Lee Road overbridge - construction works - substructure.	B	1	G4	T	-	-	-	-	-		
358776	Nash Lee End, Wendover	46/51	-	-	Day: B4009 Nash Lee Road overbridge - construction works - substructure.	B	1	G5	T	-	-	-	-	-		
359821	Forest Close, Wendover	62/68	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting excavation.	B	4	G5	T	H	-	-	-	-		
360117	Thornton Crescent,	55/59	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works -	B	6	G5	T	-	-	-	-	-		



Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
	Wendover				substructure - cutting excavation.											
360282	Witchell, Wendover	54/61	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	16	G5	T	H	-	-	-	-		
360527	High Street, Wendover	51/58	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	2	G3	T	H	-	-	D 6	-	CSV10-No3	
360527	High Street, Wendover	51/58	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	1	G4	T	H	-	-	D 6	-	*	
360527	High Street, Wendover	51/58	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	12	G5	T	H	-	-	-	-		
361026	Dobbins Lane, Wendover	55/61	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	B	14	G5	T	-	-	-	-	-		
361089	Vinetrees, Wendover	54/59	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	17	G5	T	-	-	-	-	-		
361283	Tring Road, Wendover	54/59	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	11	G5	T	-	-	-	-	-		
361353	Little Hampden Close, Wendover	58/66	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	2	G5	T	H	-	-	-	-		
361934	Dobbins Lane,	56/61	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works -	B	1	G3	T	-	-	-	D 15	-	*	





Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
	Wendover				substructure - cutting - excavation.											
361934	Dobbins Lane, Wendover	56/61	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	B	1	G <sub>5</sub>	T	-	-	-	-	-		
362513	Dobbins Lane, Wendover	55/59	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	B	1	G <sub>5</sub>	T	-	-	-	-	-		
362638	Thornton Crescent, Wendover	54/60	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	B	4	G <sub>5</sub>	T	H	-	-	-	-		
363376	Nightingale Road, Wendover	52/57	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	B	1	G <sub>3</sub>	T	-	-	-	D 7	-	*	
365348	Aylesbury Road, Wendover	48/52	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	B	1	G <sub>4</sub>	T	H	-	-	-	-		
365756	Bryants Acre, Wendover	50/55	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	B	1	G <sub>5</sub>	T	H	-	-	-	-		
366563	Lionel Avenue, Wendover	50/54	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	B	1	G <sub>5</sub>	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
366745	Aylesbury Road, Wendover	53/58	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	B	3	G3	T	-	-	-	D 10	-	*	
367404	Aylesbury Road, Wendover	47/51	-	-	Day: Wendover Green Tunnel: phase 2b sections C and D - construction works - substructure - cutting - excavation.	B	1	G5	T	-	-	-	-	-		
368702	London Road, Wendover	42/52	-	-	Day: haul route movements - on site.	B	1	G5	T	H	-	-	-	-		
368776	Rocky Lane, Wendover	49/56	-	-	Day: haul route movements - on site.	B	1	G5	T	-	-	-	-	-		
369123	Hale Lane, Wendover	46/51	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure .	B	1	G5	T	-	-	-	-	-		
369223	Church Lane, Wendover	56/62	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	B	1	G3	T	H	-	-	D 21	-	CSV10-No2	
369461	Heron Path, Wendover	54/60	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	1	G5	T	H	-	-	-	-		
370197	Church Lane, Wendover	52/58	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	1	G4	T	H	-	-	D 6	-	CSV10-No1	
370197	Church Lane,	52/58	-	-	Day: Wendover Green Tunnel: phase 2a	B	1	G5	T	H	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L <sub>pAeq</sub> [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
	Wendover				section B - construction works - substructure.											
371603	The Poplars, Wendover	53/58	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	1	G3	T	-	-	-	D 6	-	*	
371673	Jusons Glebe, Wendover	53/57	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	3	G5	T	-	-	-	-	-		
700312	Hale Road, Wendover	49/55	-	-	Day: Wendover Green Tunnel: phase 4 section A - reinstatement - finishes/embankment - filling (Including removal of props).	B	1	G5	T	-	-	-	-	-		
709512	Manor Road, Wendover	51/56	-	-	Day: Wendover Green Tunnel: phase 2a section B - construction works - substructure.	B	1	G4	T	-	-	-	D 11	-	*	
709513	Wharf Road, Wendover	50/55	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	B	1	G4	T	-	-	-	D 8	-	*	
709514	Wharf Road, Wendover	51/56	-	-	Day: Wendover Green Tunnel: phase 3 section B - construction works - substructure.	B	1	G4	T	-	-	-	D 10	-	*	

## Airborne sound: indirect effects

- 4.3.9 Construction road traffic associated with the construction phases of the Proposed Scheme will generate airborne noise. The change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted, based upon traffic information for the Proposed Scheme. The results for the roads where potentially significant effects could arise are presented in Table 4.
- 4.3.10 Explanation of the information within Table 4 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

	Where the significant effect column is highlighted, then a significant effect is identified on nearby communities or individual receptors
<b>Change values</b>	
	Yellow denotes a minor impact – a change of between 3 and 5dB or between 1 and 3dB where a high existing sound level is identified
	Orange denotes a moderate impact – a change of between 5 and 10dB or between 3 and 5dB where a high existing sound level is identified
	Red denotes a major impact – a change of more than 10dB or more than 5dB where a high existing sound level is identified

**Table 4: Assessment of construction traffic noise levels**

Road name	Link	Future baseline sound level (dB)	Future baseline sound level + construction traffic (dB)	Change (dB)	Significant effect
		Daytime $L_{pAeq,16hr}$ 0700-23:00 free-field	Daytime $L_{pAeq,16hr}$ 0700-2300 free-field		
Bowood Lane	Wendover Dean	31.3	41.1	+9.8	
Small Dean Lane	Wendover	42.7	47.5	+4.8	

## 4.4 Assessment of significant effects

### Residential receptors: direct effects – individual dwellings

- 4.4.1 Taking account of the avoidance and mitigation, the three residential buildings on Bacombe Lane (represented by Assessment Location 359406) and approximately 10 residential buildings on Ellesborough Road (represented by Assessment Locations 359570, 359628 and 700317) that are closest to the construction boundary are forecast to experience noise levels higher than the noise insulation trigger levels (as defined in the draft CoCP) due to activities associated with the Wendover Green Tunnel construction site. For daytime construction the trigger level is 75dB<sup>2</sup>.
- 4.4.2 The mitigation measures, including noise insulation, will reduce noise inside all dwellings, including those mentioned in the previous paragraph, such that it does not reach a level where it would significantly affect<sup>1</sup> residents.

### Residential receptors: direct effects – communities

- 4.4.3 The avoidance and mitigation measures in this area will avoid airborne construction noise adverse effects<sup>1</sup> on the majority of receptors and communities. Residual temporary noise or vibration effects are identified later in this section.
- 4.4.4 With regard to noise outside dwellings, the assessment of temporary effects takes account of construction noise relative to existing sound levels.
- 4.4.5 In locations with lower existing sound levels<sup>3</sup>, construction noise effects<sup>3</sup> are likely to be caused by changes to noise levels outside dwellings. These may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life. These effects are considered to be significant when assessed on a community basis taking account of the local context<sup>3</sup> as identified in Table 5.

<sup>2</sup> L<sub>pAeq,0800-1800</sub> measured outdoors at the building façade.

<sup>3</sup> Further information is provided in Volume 5: Appendix SV-001-000.

**Table 5: Direct adverse effects on residential communities and shared open areas that are considered to be significant on a community basis**

Significant effect number	Type of significant effect	Time of day	Location	Cause (construction activities)	Assumed duration of impact and details
CSV10-Co1	Noise	Daytime	Wendover: approximately five dwellings on Bacombe Lane	Wendover Green Tunnel construction, earthworks with typical and highest monthly noise levels of around 70dB and 75dB <sup>2</sup>	One year and four months
CSV10-Co2	Noise	Daytime	Wendover: approximately 20 dwellings on Ellesborough Road	Wendover Green Tunnel, earthworks and Ellesborough Road, earthworks with typical and highest monthly noise levels of 60-70dB and 65-80dB <sup>2</sup>	Six months to one year and three months

- 4.4.6 At Assessment Location 359406, representative of receptors on Bacombe Lane, the quantitative assessment has identified that three receptors will be subject to levels in excess of the impact criteria as a result of construction activities associated with Wendover Green Tunnel. Further investigation has identified that it is likely that approximately five dwellings are likely to be subject to noise levels above the impact criteria and as such a significant effect (CSV10-Co1) has been identified.
- 4.4.7 Detailed information regarding landscape earth works was not available at the time of the quantitative assessment. Therefore a screening assessment of the effects of noise arising from these works on residential and non-residential receptors has been undertaken by determining the minimum distance from the works site boundary at which the onset of a construction noise impact would be expected. In accordance with the draft CoCP these effects will be subject to review as part of a Section 61 application process for the construction works. The screening assessment used represents a worst case scenario. The assessment has resulted in identification of no likely significant effects on residential receptors, taking account of the number of properties and magnitude of effect.

### **Residential receptors: indirect effects**

- 4.4.8 Significant noise effects on residential receptors arising from construction traffic are unlikely to occur in this area.
- 4.4.9 Potentially significant changes in noise as a result construction traffic have been identified on Bowood Lane and Small Dean Lane, however, based on the absolute level of noise expected as a result of these changes, significant effects are unlikely at residential receptors.



## Non-residential receptors: direct effects

- 4.4.10 Significant construction noise or vibration effects have been identified on a reasonable worst case basis on the following non-residential receptors:
- Chiltern Way Federation School, Wendover Campus, Wendover (CSV10-No1). Significant noise effects<sup>1</sup> have been identified during the daytime with noise levels rising at times to 60dB<sub>4</sub> during the construction of the Wendover Green Tunnel;
  - St Mary's Church, Wendover (CSV10-No2). Significant noise effects have been identified during the daytime with noise levels rising at times to 60dB<sup>4</sup> during the construction of the Wendover Green Tunnel; and
  - Community Hall, Witchell Road, Wendover (CSV10-No3). Significant noise effects have been identified during the daytime with noise levels rising at times to 60dB<sup>4</sup> during the construction of the Wendover Green Tunnel.
- 4.4.11 A construction noise impact has been predicted at The Red Lion Hotel, Wendover, represented by Assessment Location 360527. The reported noise level represents the worst affected floor which is the second floor. The hotel is a two storey building and as such the noise level at the first floor should be considered, levels at the first floor are likely to reach 50dB<sup>2</sup>. This level is below the assessment criteria and as such does not result in a significant effect.
- 4.4.12 A construction noise impact has been predicted at St Anne's Church and church hall, Wendover, represented by Assessment Location 366745. The reported noise level represents the worst affected floor which is the second floor. The church and hall do not have sensitive windows above the first floor and will, therefore, be subject to a reduced noise level reaching 55dB<sup>2</sup> relative to a baseline level of 56dB<sup>5</sup>. This level is below the assessment criteria and as such does not result in a significant effect.
- 4.4.13 A construction noise impact has been predicted at the community hall on Icknield Close, Wendover, represented by Assessment Location 371603. The reported noise level represents the worst affected floor for all properties represented by this assessment location which is the second floor. The community hall is located on the ground floor and as such is exposed to reduced level of construction noise reaching 56dB<sup>2</sup>. When considering the baseline sound levels in the area this is within the assessment criteria and as such does not result in a significant effect.
- 4.4.14 A construction noise impact has been predicted at the Wendover Health Centre, represented by Assessment Location 356230. Due to the design of the building, likely additional local screening effects and the short duration of the impact this is not considered to result in a significant effect at this location.
- 4.4.15 A construction noise impact has been predicted at the John Hamden County Infant School, Wendover, represented by Assessment Location 709514. The reported noise

<sup>4</sup> Equivalent continuous sound level at the facade, L<sub>pAeq, 0700-1900</sub>.

<sup>5</sup> Quoted dB values at residential areas refer to the facade 12 hour daytime (07:00 to 1900:00) equivalent continuous sound pressure level, L<sub>pAeq,12hr</sub>.

level represents the worst affected floor for all properties represented by this assessment location which is the second floor. The school is ground floor only and as such is exposed to reduced level of construction noise with levels dropping by approximately 5dB at ground floor. This reduces the predicted level to below the assessment criteria and as such does not result in a significant effect.

- 4.4.16 A construction noise impact has been predicted at the John Colet County Secondary School and the Wendover Memorial Hall, Wendover represented by Assessment Location 709512. The reported noise level represents the worst affected floor for all properties represented by this assessment location which is the second floor. The school and memorial hall are two storey only and as such are exposed to reduced levels of construction noise at the first floor. In addition to local screening effects this will reduce the predicted level to below the assessment criteria and therefore does not result in significant effects.
- 4.4.17 A construction noise impact has been predicted at the Wendover Church of England Junior School, Wendover, represented by Assessment Location 709513. The reported noise level represents the worst affected floor for all properties represented by this assessment location which is the second floor. The school is ground floor only and as such is exposed to reduced level of construction noise with levels dropping by approximately 5dB at ground floor. This reduces the predicted level to below the assessment criteria and as such does not result in a significant effect.
- 4.4.18 A construction noise impact has been predicted at The British Legion hall, Wendover, represented by Assessment Location 363376. The reported noise level represents the worst affected floor for all properties represented by this assessment location which is the third floor. The hall is ground floor only and as such is exposed to reduced level of construction noise reaching 53dB<sup>2</sup>. When considering the baseline sound levels in the area this is within the assessment criteria and as such does not result in a significant effect.
- 4.4.19 A construction noise impact has been predicted at a pavilion building of 9 the Pennings, Wendover, represented by Assessment Location 361934. The reported noise level represents the worst affected floor for all properties represented by this assessment location which is the third floor. The pavilion is ground floor only and as such is exposed to reduced level of construction noise reaching 56dB<sup>2</sup> relative to a baseline level of 56dB<sup>5</sup>. This level is below the assessment criteria and as such does not result in a significant effect.

### **Non-residential receptors: indirect effects**

- 4.4.20 Significant noise effects on non-residential receptors arising from construction traffic are unlikely to occur in this area.
- 4.4.21 Potentially significant changes in noise as a result of construction traffic have been identified on Bowood Lane and Small Dean Lane. However, based on the absolute level of noise expected as a result of these changes, significant effects are unlikely at non-residential receptors.

## Cumulative effects from the Proposed Scheme and other committed development

4.4.22 This assessment has considered the potential cumulative construction noise effects of the Proposed Scheme and other committed developments<sup>6</sup>. In this area, planning consent has been approved for a construction project at Chiltern Way Federation School Wendover Campus (Church Lane, Wendover) that may be built at the same time as the Proposed Scheme. If the aforementioned construction coincides with that of the Proposed Scheme then adverse noise effects may be prolonged, or increased in magnitude, at the following non-residential receptors:

- Chiltern Way Federation School, Wendover Campus on Church Lane, denoted by CSV10-No1 in Table 5.
- St Mary's Church on Church Lane denoted by CSV10-No2 in Table 5.

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<sup>6</sup> Refer to Volume 5: Appendix CT-004-000.

## 5 References

Control of Pollution Act 1974 (c.40). London, Her Majesty's Stationery Office.